

THE AISLE VAULTING OF WINCHESTER TRANSEPT.

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THE transept of Winchester Cathedral is well known as one of the grandest monuments of early Norman architecture in England. Like most other Norman works, it has no high vaulting, nor any proper provision for such vaulting; but its aisles are vaulted throughout, and are of peculiar interest as affording instructive illustration (1) of the character of early Norman vaulting without ribs, (2) of the same vaulting with ribs added later to the groins, and (3) of vaulting that appears to have been entirely rebuilt on groin ribs by Norman craftsmen. The original vaults date from near the close of the eleventh century, but the times of the additions and rebuildings are uncertain, though from the profiling and the jointing of the ribs it would appear to have been considerably after the fall of the crossing tower—which appears to have happened in the year 1107—and could hardly, I think, have been before the second quarter of the twelfth century. The plan of this transept includes, in each arm, an aisle on each side and a return aisle on the end. There are three bays in each side aisle and two bays in the return aisle; thus in both arms together there are sixteen compartments of vaulting.

To the casual eye these vaults appear of but two kinds, and even Willis, in his monograph on Winchester Cathedral,* speaks of them (p. 25) as "plain groined vaults" and "ribbed" vaults respectively, without remarking any points of difference among those with ribs; and he appears to suppose, though he does not affirm, that the ribbed ones were built at the time of a partial reconstruction, which seems to have taken place soon after the fall of the tower. My friend Mr. John Bilson, however, in *The Beginnings of Gothic Architecture*,† says (p. 301) that "in the reconstructed bays . . . the vaults were entirely rebuilt as ribbed vaults," but (on p. 302) he qualifies this by remarking that "in the northernmost bay of the east aisle of the north transept, which would not be affected by the fall of the tower, the vault itself does not appear to have been rebuilt, but the ribs seem to have been added to the original vault, and backed up to the groins." It appears to me, however, that, of the total of sixteen vaults comprised in the whole transept, ten are of the original construction and six have been rebuilt; while, of those that remain of the original work, four have had ribs added under their groins. Let us examine these vaults somewhat closely.

The headpiece to this paper gives a general view of the west side, and a part of the north end, of the north arm of this transept, and shows some of the vaults in their relation to the rest of the structure. The compartments are on plan roughly wide rectangles, and the vaults, like most other Norman vaults, are built of rubble and covered with plaster. Those of the original construction are, in idea, each in the form of two half cylinders interpenetrating at right angles, but there are no strictly cylindrical surfaces, and the manifold irregularities of the work show that they were turned on rude centering. The plan A (Fig. 1) is that of the compartment to the right of the great round column seen in the head-

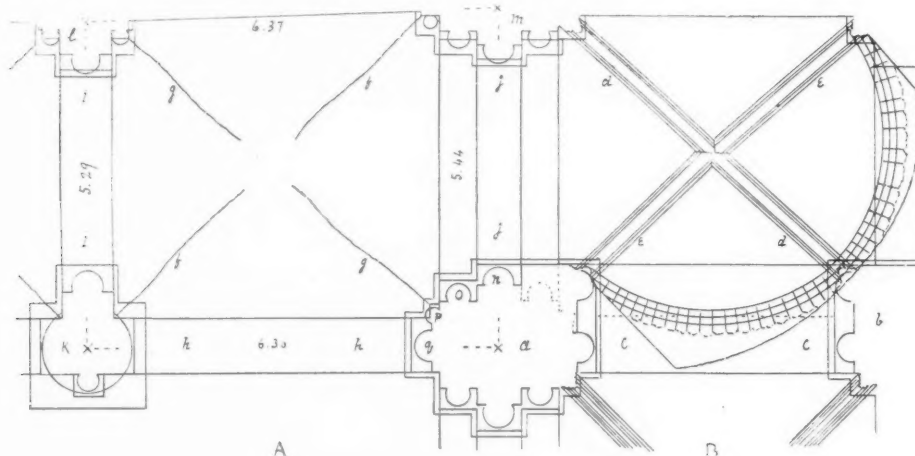


Fig. 1.

piece, *i.e.*, the eastern one of the two compartments of the return aisle. This compartment measures a little more than 5 by 6 metres from centre to centre of the supports, but its opposite sides are of unequal length, as will be seen by the figures given on the plan,‡ and thus, like most other mediæval plans, it is a little askew. The vault is, however, more nearly square than the compartment measured from the centres, because the great width of the arch *j* cuts off a part of its length. It should be remarked that the whole vault is stilted. This is an anomaly, and has no justification on structural grounds, since the arches on the wider spans would naturally be semicircular without stiling. Stiling is need-

* *The Architectural History of Winchester Cathedral*. By the Rev. R. Willis, M.A., F.R.S., &c., published in the *Proceedings of the Archaeological Institute of Great Britain and Ireland*. London, 1845.

† Published in the *JOURNAL of the Royal Institute of British Architects*. Third Series, Vol. VI, Nos. 9 and 10.

‡ These are rough measurements, but they are correct enough for our purpose.

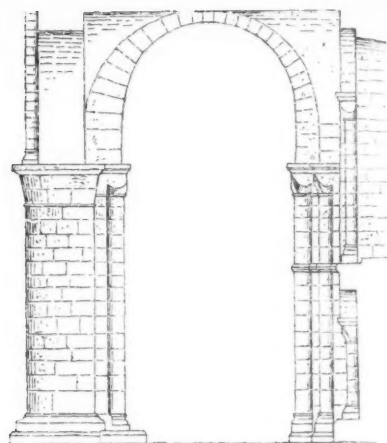


Fig. 2.

on plan, and this groin is on the longer diagonal, but also because it springs at *k* out of the re-entrant angle formed by the archivolt *h* and the transverse arch *i*, as shown in the cross section (Fig. 2), and in the perspective detail (Fig. 3), while the other points of springing are the salient angles of the stilted members; and since these stilted members are of unequal magnitudes, and the one from which this

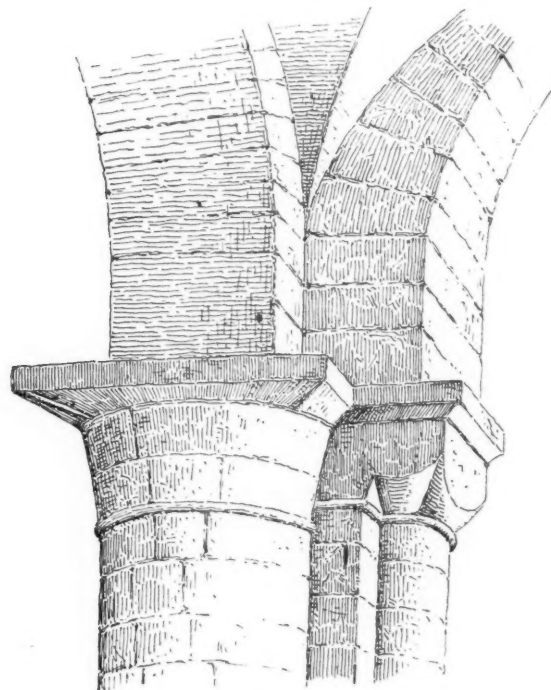


Fig. 3.

ful, of course, only on the narrow sides of a groined vault, where it serves to bring the crowns of the smaller arches up to the level of the wider ones.* Mr. Bilson remarks (p. 293) that "the haunches of the vault, for a short distance above the springing, are constructed of ashlar." I think this is an inadvertence. No ashlar reaches to the haunches, but the stilted members are of ashlar, and are surmounted by several ashlar blocks shaped to form the springing. This is seen clearly in the south-west impost of the west vault of this return aisle, and even more clearly in the south-east impost of the eastern vault of the corresponding aisle of the south arm; but it is obscure in most of the others, since the construction at the springing is more or less hidden by the plaster covering.

It will be seen that the groins of this vault are necessarily of unequal span—the groin *f* being longer than the groin *g*—not only because the compartment is, as I have said, askew

on plan, and this groin is on the longer diagonal, but also because it springs at *k* out of the re-entrant angle formed by the archivolt *h* and the transverse arch *i*, as shown in the cross section (Fig. 2), and in the perspective detail (Fig. 3), while the other points of springing are the salient angles of the stilted members; and since these stilted members are of unequal magnitudes, and the one from which this groin springs is of slight projection, the groin is further lengthened. The inequality of bulk in the stilted members is great, that of the impost at *l* measuring on plan 26 by 32 centimetres, while that of the impost at *m*—from which the groin in question springs—measures only 6 by 30; and being so shallow it does not rest on the shaft below—a member whose only use is to carry it—but on the square member against the wall with which the shaft is engaged. The reason for its small dimensions would appear to be that the arch *j* being of two orders, this impost has more members than the impost at *l*—where the stilted member is large—and the additional parts, namely, those of the upper order of the arch, take up so much room that not enough is left for more bulky stilted, without advancing the whole group, with its supports, farther into the aisle. It should be said, however, that in the corresponding impost of the south arm this member is larger; and this is managed, in part, by bringing it out farther against the stilted of the first arch order, a result of which is that the extrados of this arch is not concentric with the intrados

* In Romanesque vaulting stilted is used for no other purpose. In Gothic vaulting it is employed in the longitudinal rib in order to concentrate thrust.

on the wall side. But the room thus gained is not, I think, enough to account for the larger proportions of the stiling member here, and it may be that the whole impost and its supporting members are more salient than those of the vault we are considering; but I have not taken measurements here.



Fig. 4.

On plan the groins follow the accidental sinuosities of the rude centering,* or other accidents of free-hand workmanship, while in elevation their roughly elliptical curves are equally irregular: and it

* There is no distinct development of that sinuosity which naturally results from the intersection of a wide cylindrical surface with a narrow stilted one. The vault is not oblong enough for that.

will be noticed that they die away at the crown, so that the diagram might be understood to indicate a domical vault.* This is merely a result of rude construction with imperfectly shaped centering.

The supports of this vault differ one from another in conformity with their different loads. The support at *k*, seen to the right in the headpiece, is a round column about 1.40 metres in diameter, having a pilaster strip with an engaged shaft incorporated with it on the aisle side, to carry the transverse arch *i*, as shown in the cross section (Fig. 2). The respond *l* is made up of a pilaster strip with an engaged shaft, to carry the arch *i*, and on each side of it a small shaft engaged with a square member, for the groins springing here in this vault and the one adjoining it respectively. The support *a* is one of the great piers of the eastern arcade, and has a shaft *n* for the sub-order of the arch *j* (which is at once an archivolt of the eastern arcade and a transverse arch in respect to the vault we are considering and the vault of the eastern aisle adjoining it), a smaller shaft *o* for the first order of the same arch, a still smaller shaft *p* for the groin *g*, and a large one *q* for the archivolt *h*. The other members of this pier relate to the eastern arcade and to the vaulting of the eastern aisle. It will be noticed that the north-eastern portion of this pier presents a solid square mass of masonry with two engaged shafts on its eastern side, in place of members corresponding to those of the western side. This is a result of an alteration made to reinforce the pier in order to provide additional support for a projected tower, one of four towers that were to have been added on the outer angles of the transept, as has been pointed out by Willis. The respond *m*—the one referred to above as having included in its impost the small stiling member for the groin *f*—has a member for each of the three parts of the arch *j*, and a smaller one on each side of these for the groin *f* and for the groin *d* of the adjoining vault respectively. The photographic illustration (Fig. 4) gives a full view of this vault and its supports, as seen from the central aisle of the transept. It shows the wall arch with its stiling, and how the stiling members differ in magnitude, as I have said; though the difference is not very marked in this full view, since it is mainly in the amount of projection from the wall, and can therefore be seen fully only in a view taken more or less in the direction of the long axis of the aisle. Some of the sinuosities of the groins appear clearly, and how they die away on the broad surface of the crown of the vault. The stiling of the archivolt in front is seen also.

Such is the character of this Winchester vaulting as built in the eleventh century. It is like most other Anglo-Norman vaulting of the time, as we see it at St. Albans, at Westminster, at Smithfield, and elsewhere.

We may now consider the altered vaults. These, as I have said, appear to be four in number, and are: the northernmost two of the eastern aisle of the north arm, and the southernmost two of the corresponding aisle of the south arm. That these are the primitive vaults with ribs added later is shown by the surfaces, which are not shaped to the ribs as they would be if both were contemporaneous parts of one whole, but have the same conformation as the ribless vault that we have just examined. The groins of these vaults have, of course, elliptical curves in elevation, but the curves of the ribs are arcs of circles, and thus do not fit the groins. They have therefore to be backed up with masonry to fill the intervals between the two curves. Let us examine some of these altered vaults in detail, taking first that of the compartment *B* (Fig. 1), namely, the northernmost vault of the eastern aisle, the one mentioned by Mr. Bilson as not having been rebuilt.

This compartment, in common with the others on the outer angles of the building, was diminished in area when the reinforcements in provision for the projected towers were made. The dotted lines on the pier *a*, and on the respond *b*,† of the plan give the original outlines of these parts, and the dotted line on the arch *c* marks the north side of this arch as first built. Thus the parts that lie outside of these

* In a domical vault, as need hardly be said, the salient groins naturally die away before the crown is reached, since the vault at the crown becomes a spheroid surface.

† I regret that the dotted lines on the respond *b* have been inadvertently omitted in the diagram.

dotted lines are the reinforcements in question, which block up so much of the old vault. These reinforcements not only diminished the area of the compartment, but gave rise to awkward conditions—in addition to those inherent in the form of the vault—for the introduction of the groin ribs; for in consequence of this these ribs cannot follow, on plan, the lines of the old groins, and cannot intersect in the centre of the vault.

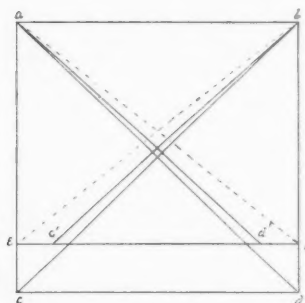


Fig. 5

For if a, b, c, d (Fig. 5) be the rectangle of the vault, with its diagonals a, d , and b, c , and if this rectangle be cut off at the line e, f , ribs springing from the points a, d' , and b, c' , and straight on plan, will not, of course, coincide with the diagonals of the larger rectangle, nor intersect in its centre. Neither can the ribs follow the diagonals of the diminished rectangle, indicated by the dotted lines, since, by the enlargement of the supports, the springing points, c' and d' , on the south side are brought nearer together than those on the north side, and thus the four points of springing are in the angles of a trapezoid, instead of being in those of a rectangle, as in the case of an apsidal aisle vault. But the ribs of this vault do not strictly conform to this diagram, though they do so virtually. For the builder, in adjusting his ribs to the salient angles of the reinforced pier and respond, has made only the rib d (B Fig. 1) straight on plan, while he has broken the rib e to an angle. In doing so he has

not made the inner part of the rib meet the opposite part with precision, its axis falling to one side of that of the other, as shown on the plan. Had this rib been made straight on plan like the other it would have brought the point of intersection a little nearer the south side of the vault, and so diminished the area of the south cell, already smaller than the others. It may have been in order to avoid this that he broke the rib to an angle. I do not profess to read these curious results of mediæval empirical workmanship in all respects correctly, but the facts are as I state them.

In elevation the ribs are necessarily segments of less than half circles, since they could not otherwise be got under the crown of the vault. And since their points of springing, on the south side, are on plan at a considerable distance from those of the vault itself, they are also, on this side, at a considerable vertical distance from the groins, and their backings have therefore to be deeper here than on the other side, as will be seen in the elevation of the rib e folded down on the plan, and in the photograph (Fig. 6), showing the whole system as seen from the return aisle. For let a, c, b (Fig. 7) be the stilted elliptical groin arch of the vault, if we spring a segmental rib under it from the points a and b , the backings required to fill the spaces between the two curves will be equal on the two sides; but, if the arch be sprung from the points a and e , the backing over e will be deeper than that over a , as we find it here.* It is worthy of notice that the backings in this vault are, for the most part, in almost vertical planes cutting the vault surface sharply. In the other altered vaults this is generally not so, as we shall see. The ribs are profiled as in Fig. 8, and are about 30 centimetres in thickness. The voussoirs vary a good deal in width, but are generally narrow. They are well cut and closely jointed; but except at the crown, where they are fitted up to the surface of the vault, they are of varying depth, and are not cut at the extrados, as will be seen in both the diagram and the photograph. The feeble boss of leafage at the intersection, not very clearly seen in the photograph, is of course no part of the twelfth century work, and the window with mullions and tracery, seen in the east wall, is also an interpolation, as will be naturally understood. Another late pointed window has been inserted in the north wall, the acute arch of which reaches higher than the vault surface, so that this surface has had to be cut away to accommodate it.

Let us examine the photograph (Fig. 6) a little more in detail, beginning with the reinforcements of the pier and respond. These reinforcements must, it would seem, have been made almost immediately

* Just how the reinforcements bring about these conditions may be seen in the concrete in the corresponding vault of the north-west angle, which remains without ribs.

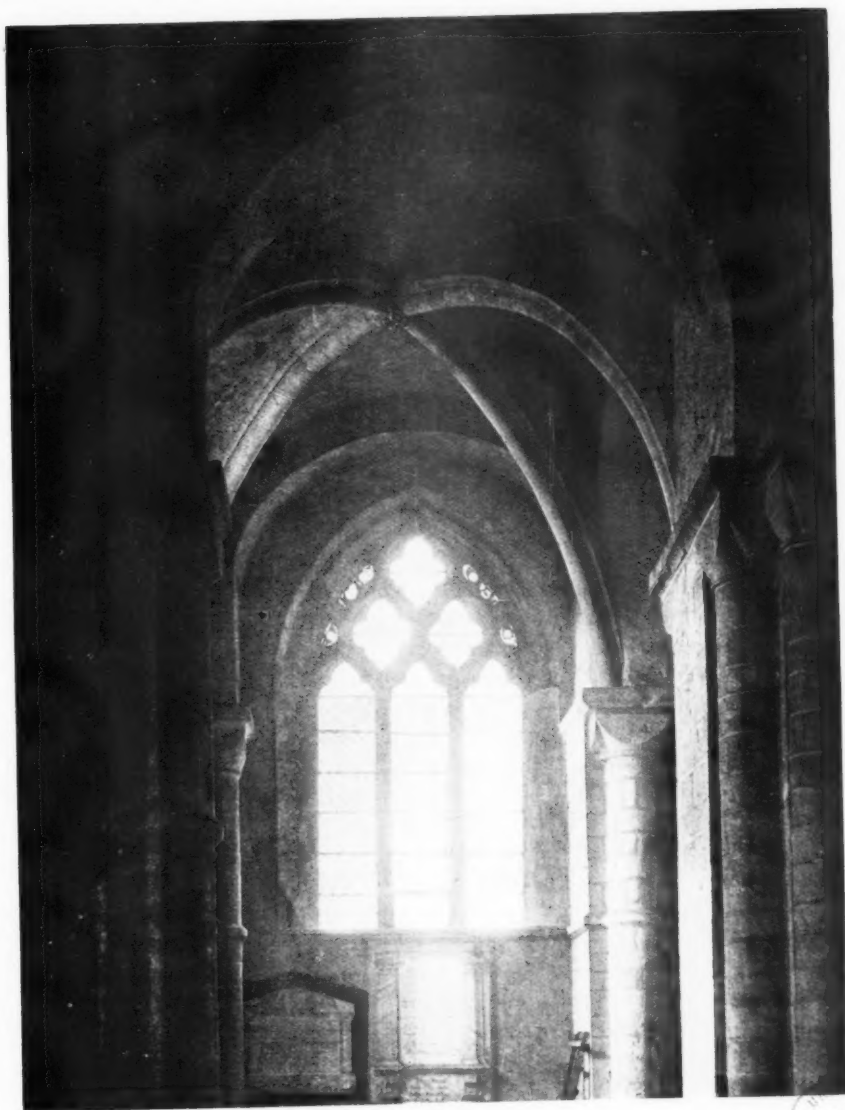


Fig. 6.

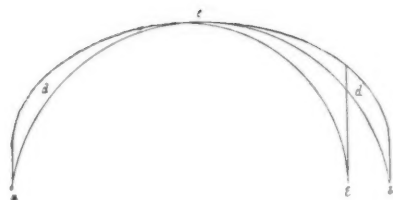


Fig. 7.

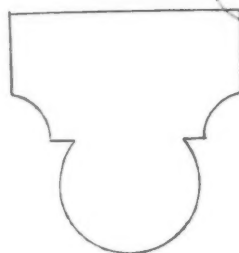


Fig. 8.



after the first completion of the piers ; for the character of the masonry corresponds closely with the primitive work that remains. The two shafts to the extreme right belong to this primitive work, and relate, as will be seen, to the two orders of the great arch—the arch *j* of the plan (Fig. 1). There was, of course, formerly, and probably still is, embedded in the reinforcing mass a shaft on the farther side of the pier corresponding to the smaller of these two, to carry that side of the upper arch order, as shown in the dotted outline on the plan. The flat masonry beyond these shafts is the reinforcement, with its impost moulding continuing the abaci of the primitive capitals, and a part of the capital of the reinforcing shaft on the farther side, showing on the angle. Of the respond we see only the reinforcement, consisting of a square member with an engaged shaft, corresponding to the one whose capital we see a part of on the angle of the pier. To the right of this shaft, but in this view hidden by the pier, a part of the capital of the primitive groin shaft is visible emerging from the reinforcing parts. The flat reinforcing masonry rising from the pier, flush with the face of the stilted portion of the sub-order of the transverse arch, is carried up till it cuts the soffit of the first order ; but the cutting line is hidden from view in the photograph. The reinforcing mass rising from the respond cuts the soffit of the wall arch, or rib, in like manner, but the cutting line is again hidden, from this point of view, by the groin rib that springs from the respond. It should be remarked that there is a wall arch, or rib, like the one seen in the photograph, in each bay of the eastern aisle, and each respond of this aisle has a shaft on either side to support it. We see one of these shafts in the north-east angle to the left of the window, but the corresponding one, on the north side of the respond, is now embedded in the reinforcement. In the western aisle there are no wall arches, and therefore no such shafts in the responds there.

The manner in which the ribs are inserted at the springing in the salient angles of the reinforcing masonry—the rough edges of the cavity that was opened to receive them being covered with plaster rounded up to their embedded mouldings—is clearly seen in the impost of the respond. It will be seen, too, how the point on which the ribs intersect falls to the left of the centre of the compartment, as explained above. I have said that the curves of the ribs are arcs of circles struck from centres below the springing level, so that they form angles with their supports ; but in the foreshortened view of the photograph this is not so apparent as it would be in a lengthwise view. They are not, however, single arcs. Each rib is made up of two arcs, as it will be seen that they must be, since their opposite sides are unequal in length—the south sides being the shorter—while at the same time they spring from the same level as the other sides and meet them at the crown of the vault. The photograph shows also how the backings are carried up vertically, and cut the vault surface, as already stated.

(To be continued.)

TOWN PLANNING.

PRÉCIS OF MR. LANCHESTER'S MADRAS LECTURES.—IV.

(Continued from p. 260.)

The sixth lecture dealt with "City Life and Housing," and was illustrated by slides showing plans of houses and villages both in Europe and in South India.

The poet's saying "Let me make the people's ballads and I care not who makes their laws," might, said the lecturer, be paraphrased with respect to housing: "Let me provide their houses and I care not who does the rest." The standard of life in the home is bound in the long run to react on the city as a whole. What can be done to give an uplift to the general standard of housing? The first consideration must be the character of those to be accommodated and their legitimate demands in the way both of individual and communal accommodation. We must, how-

ever, go farther than this, not merely giving what they at present demand, but studying to realise and provide what they ought to demand, raising, by means of a wise provision, the standard of practical efficiency and artistic taste. Once a city has justified its economic existence, the study to be next pursued is that of fostering the best type of citizen. This study begins with the home and its adjuncts. The necessity for providing as much garden ground as is economically practicable is securing general recognition. A well aerated garden has a most potent influence on the health and mental activity of the young. A strip of ground shut in by rows of houses is inadequate, and while the cost of roads often precludes the general adoption of detached residences, a satisfactory compromise may be effected by grouping houses in blocks of three or four, so that the air may circulate freely.

The school and children's recreation ground are important factors in the education of the future citizen, and should be considered by those entrusted with the preparation of

a city plan. These factors are influenced by the views of experts in education as to how far the children may be permitted to play in small spaces provided in immediate proximity to their homes, and how far their exercises should be conjoined with school life and under the supervision of trained teachers. The educational methods of the Dottorressa Montessori, in so far as they modify those of Froebel and other great educational leaders of the past, are likely to create a demand for school premises of a very different type from the existing ones.

As regards the adult, every encouragement should be offered for mental and physical recreative exercises. One of the principal defects of the modern large city is the dependence of the residents for amusement on the spectacles and entertainments provided by others, rather than on exercises developing their own faculties. Every city should aim at providing, in convenient positions, recreative centres, where the organisation of games and entertainments by the people themselves may be judiciously encouraged, so that, by this means, mental activity and resourcefulness may take the place of the sluggish apathy so often noticeable as the result of the inevitable monotony of many industrial occupations.

The lecturer went on to speak of the Indian house, which at its best, he said, was altogether admirable—only it was so seldom at its best. Social conditions were responsible for a tendency to overcrowding. A given area is occupied by those of one religion, caste or trade; owing to the contiguity of other castes or trades incompatible with the first, this area is unable to expand, and increased provision can only be made by packing houses closer on the ground. Again, the division of property among members of a family tends in the same direction: what was once a suitable house is divided and redivided, so that it ceases to be a convenient or healthy dwelling-place. The *pial* (= verandah) is enclosed, the court built over, extensions made at the back, and many rooms no longer get light and air. Housing of this type reacts on the national temperament; being accustomed to overcrowding, people feel no repugnance to such a mode of life; physique deteriorates, and, rather than undertake extra exertion, workers will pack themselves into inadequate accommodation because it is near their work or near a busy and cheerful locality. A remedy might be found by providing pleasantly-arranged building areas, easy of access, and as near as possible to the congested districts. Added to this, skilfully-organised adjustments would be required, so that the various castes or trades should not be violently uprooted, but offered some special inducement to remove, such as increased open space, or improved facilities. In laying out new extensions, future difficulties may be guarded against. The area need not be filled up solidly at once. Alternate sections or sites may be kept in hand and temporarily let as gardens or for some other suitable purpose. Then, when a reasonable claim is made out for a house site in proximity to those occupied, one of these can be allotted. By this means the desires of increasing families can be acceded to without creating congestion.

In planning extensions, while there may be no practical objection to treating these as separate and detached communities, there is a considerable risk that they will fail to attract for this reason. A site, to be popular, should be brought in as close relationship as possible to the busy life of the city, and particularly to that of the quarter from which it is hoped to draw off the surplus population; a little ingenuity and expense is not thrown away in achieving this aim.

In the seventh lecture, "Commerce and Traffic," Mr. Lanchester laid stress on the necessity for a synthetic study of all the aspects of civic life. Civic studies are essentially synthetic, and can only be sub-divided as a prelude to an ultimate re-combination. The mistake has been too often committed of making a special study the basis of a series of proposals, without regard to the conditions as a whole. With street traffic and improvement too often a partial investigation has been regarded as conclusive. The obvious and easy course of finding out where streets are overworked and providing relief by widening or some other method has been responsible for much ill-considered destruction. Even when we investigate traffic alone we should go much farther than this. The most comprehensive study of commerce and traffic has moreover to be related to the other aspects of city life.

For all questions relating to the manufacture and handling of the production and exports of the city, and similarly with regard to the produce and goods she takes in exchange, the Chambers of Commerce and Trading Associations are the proper bodies to be consulted. This will be found beneficial in two ways. First, the closer relation between those skilled in business and the Municipality will be conducive to city developments being carried out on lines leading to commercial prosperity; secondly, those perhaps too closely concentrated on purely economic activities will come to see that these must be looked at in conjunction with the convenience and amenity of the city, if it is to remain permanently great. With any large community the utmost care must be exercised to maintain the human type at its best; the tendencies to deterioration are numerous and subtle, so that if we proceed solely on the basis of immediate economic success, these tendencies will begin to operate and ultimately the advantages we have gained will be neutralised, owing to deterioration in the type of citizen. On the other hand, if we concern ourselves solely with the beauty and amenity of the city, regardless of its economic demands, we may find that, while possessing many attractions and delights, it is no longer able to earn its living.

The synthetic study of the aspects of civic life will be more clearly and definitely accomplished if it is preceded by those special studies that have been divided under the various headings described in the lectures on the Civic Survey [pp. 224-5].

The lecturer passed on to a more detailed consideration of this special branch of civic study, and recapitulated the main headings under which the study should be taken up. We may start with the import of goods: what is imported, for what purpose, how it comes, where and by what means it enters the city, how handled and sub-divided, its destination, whether food or clothing for the individual, raw material for the factory, etc., our object being to see whether all such goods are dealt with in the most economical way, or whether by remodelling or some other form of improvement we may not be able to facilitate and cheapen these operations. In like manner we must deal with every class of goods made or dealt with for export from the city, following the operations step by step on the look-out for more advantageous methods. In conjunction with this, we must consider also the location of the workers, whether convenient or inconvenient for their employment, how loss of time and energy can be minimised by improved facilities for locomotion, allocation of areas for housing, and so on. This done, we have the material on which to base a reliable conclusion as to any proposition for improvement. We can say whether

the cost would be justified economically or not. As an example of method, the lecturer took the traffic question by itself in order to give an idea of the type of analysis he would propose.

Two factors in the study of traffic conditions have not hitherto been adequately dealt with. One of them is the lack of regulations for sorting out the fast and slow traffic and directing these as far as possible into distinct lines of route. The other is the investigation as to how far the traffic in a busy street is "internal," that is to say, from one point in the street to another, and therefore incapable of diversion. Statistics on this basis are not easy to obtain, but a great deal may be done by securing a fair general impression of the manner in which such a street is used. Where it is mainly a shopping street, there can be no doubt that much of the traffic is of this kind, consequently it would be well to regard such a street as far as possible independently from the general provision of traffic routes.

Discussing how the definite economic influence on city improvements may be investigated, the lecturer said that the dominating factor which has been recognised as the main objective of recent investigations is the organisation of traffic, though, of course, there are other considerations more or less linked up with this. The first requirement is to obtain values by distance and by time for each class of vehicle affected, so that any saving in mileage or time can be definitely estimated. For this purpose vehicles can be classified on the lines accepted in the published traffic reports and a value assigned to each. The next procedure is to obtain statistical information on the traffic likely to be affected, and to estimate what proportion of it will be advantaged, and to what extent this proportion will gain in distance or time. In the gathering of these statistics it is not only necessary to estimate volume of traffic, but to dissect its purpose in detail.

In analysing the traffic in regard to an improvement, it is of the first importance to separate the local from the through traffic, on the basis of defining as local traffic that which cannot be diverted, and through traffic that which may, while the latter will again require sub-division, accordingly as it is more or less advantaged by a new route. Traffic economics, however, are not the only considerations; safety to life and limb must be regarded, together with a number of small comforts and conveniences incidental to a well-devised improvement scheme, such as advantages to health, reduced mental tension, and general amenity.

REVIEWS.

PROTECTION OF ANCIENT BUILDINGS.

The Society for the Protection of Ancient Buildings: Thirtieth Annual Report of the Committee, June, 1916.
[20 Buckingham Street, Adelphi, London, W.C.]

The Annual Report of the Society for the Protection of Ancient Buildings is always interesting reading, and the Report issued in last June is no exception. It is a plain statement of useful work done in spite of the crippling effect of the war on all such Societies and on the outside public. It makes one hopeful for the future, spite of these dark days for the architectural profession and all lovers of ancient buildings.

One thing is very evident in reading this Report, viz., the moderation and sweet reasonableness which

characterise the present-day policy of the Society. This is especially noticeable to those who, like the present reviewer, remember the somewhat quixotic attitude which it adopted in its earlier years, when every architect, *per se*, was the enemy, and there was only one gospel. Perhaps the touch of fanaticism, of no compromise, was necessary for those days: that the Society had to combat gross ignorance, deep-seated prejudice, and something even more powerful, we may now all frankly admit. The great Goddess Diana had her craftsmen then, who picked up a very tidy living among the silver shrines, and, not unnaturally, they foresaw the crippling of the comfortable and pious industry built up and ministered to by the Pugins, Scotts and Streets. Those were the days—and they are not yet passed from us—when the Church Shop, with its machine-made brass fittings and painted glass, at so much per foot super, reigned supreme and unchallenged.

Not all the early efforts of the Society were mere tilting at windmills. It can honestly claim to have indoctrinated the present generation of architects, as well as many of the more cultured clergy and laity, with that which is the essence of its gospel—jealous regard for our ancient buildings and their fittings, or, in other words, for those things which are part and parcel of the history of these Islands. It is a pleasure, *per contra*, to notice that, while great guiding principles are maintained, the basis of the Society has broadened within recent years, so that many independent and often hostile critics, such as the present reviewer, can conscientiously avow themselves supporters of its good work. We, who have perhaps groaned at blue bricks, little piles of tiles (which, by the way, will at no distant date be quoted by guide books as evidences of Roman work), steel joists and other bald and aggressively high-principled devices, need no longer stand aside, half sympathetic, half irritated, but join forces in a united defensive movement against the modern Philistine. We—by which let us understand all men of goodwill, professional architects and others—are not called upon to pronounce the narrow shibboleths of former days, but to use a certain very precious liberty of conscience as to minor matters of taste and opinion.

Reviewed in this light one can find nothing but good in this Annual Report, the terse descriptions of which are rendered lucid by admirable photographs. Note especially the first and last illustrations—showing the exquisite churchyard cross, with its beautiful Madonna and Child, at Tyberton, Herefordshire—an example of "restoration" in its true sense. Mr. Somers Clarke, F.S.A., a veteran architect-member, has words of wisdom for us in the preface specially pertinent to this war-time, when we are threatened by a plague of disfiguring "memorials, as per catalogue."

The repair of Hadleigh Guildhall, Suffolk, an interesting timber-framed structure, of early Tudor date; of Somerton Market Cross (p. 40), both admirably illustrated, may be instanced as wholly successful inter-

ventions of the Society. Its efforts to save the quaint old "Dolphin" at Guildford (p. 26) unfortunately failed to move a Corporation which quite recently has shown a scandalous indifference to the dangers from fire to which one of the lions of the ancient borough—Abbott's Hospital—is exposed, from mean properties on Corporation land being actually built up against its venerable walls. In Glasgow (p. 26), to take another case of municipal stupidity, the Society has fought for the cause of the well-known Tolbooth-Steeple, with, as yet, uncertain results. Truly we need not go as far as Germany in search of Huns. It is nice, too, to find that such a humble gem as the stone Pigeon-House at Tiddington, Gloucester (p. 24), can be championed to good purpose by the S.P.A.B.

PHILIP M. JOHNSTON [F.], F.S.A.

LIMES AND CEMENTS.

Limes and Cements: Their Nature, Manufacture and Use. An Elementary Treatise, by Ernest A. Dancaster, B.Sc. 8o. Lond. 1916. 5s. net. Pp. 212. [Crosby Lockwood & Son, 7 Stationers' Hall Court, E.C.]

This is a new and up-to-date edition of the old and well-known treatise on *Limes, Cements, Mortars, &c.*, by G. R. Burnell, C.E., in Weale's Series.

One cannot help feeling that the present author, or editor, could have produced a more successful modern "elementary treatise" had he been free to recast entirely the earlier volume on which this is avowedly modelled. The putting of new wine into old bottles is rarely altogether successful, and while considerable trouble and ingenuity have undoubtedly been exercised in bringing the information contained in each chapter as much up to date as possible, and illustrations of machinery, etc., have been introduced, materially assisting the explanations, the arrangement of the subject-matter is not as methodical as might be expected from a modern text-book. Our knowledge of all the materials dealt with in this volume has developed rapidly in the last quarter of a century, and yet, comparing this with a former edition published some twenty-five years ago, a great deal of matter is found to be reproduced in almost its original form. For example, under the heading of Portland Cement one naturally looks for the latest information on the subject to be collected and collated. But the early chapter with this heading being modelled on the older edition, when the material was comparatively in its infancy, has now to be supplemented by two chapters at the end of the volume in which the chemical analysis and the properties covered by the British Standard Specification are dealt with.

Written originally by a Civil Engineer, and now revised by a Bachelor of Science, the book is probably intended to appeal mainly to students of those two branches of knowledge; and while the architectural student will be able to learn much that will be useful to him, he will at the same time find many modern materials with which he has to deal unmentioned, and many of the difficulties arising in modern practice

untouched upon. For example, the important group of Plaster Cements is dismissed in a paragraph and summarised as being "liable to one objection—namely, the expense"; while cement mortar is merely described as employed "in masonry which is exposed to the action of running water . . . and more recently in many large works on dry land where great strength is required; it is also used as a surface coating to cover masonry or concrete walls and for other purposes."

However, a book that has so long survived and has passed through so many editions (the former edition referred to above being the thirteenth) must have proved of considerable service to a large number of students, and their successors in the present generation will no doubt welcome this new edition, which, from the long list of authorities quoted, has evidently been the result of much painstaking research.

HERBERT A. SATCHEL [F.].

COMPETITIONS.

Australian Federal Parliament House.

As already announced in the Professional Press, a deputation consisting of Mr. H. V. Lanchester, Chairman, and Mr. Herbert A. Welch, Secretary of the R.I.B.A. Competitions Committee, waited upon the High Commissioner of the Commonwealth of Australia in London to ask, on behalf of the architects of the Allied countries, for the postponement of this competition until after the war. The deputation received a very sympathetic hearing and the Commissioner undertook to cable his Government at once and put before it the views of the Institute as expressed by the deputation. The reply of the Australian Government has now been received and is communicated to the Institute in the following letter addressed to the Secretary from the Office of the High Commissioner:—

18th September, 1916.

SIR,—With reference to the deputation which waited upon the High Commissioner from your Institute re the competition for the Federal Parliament House at Canberra, I am directed by the High Commissioner to state that having communicated by cable with the Commonwealth Government, he has now received a cablegram in reply as follows:—

"With reference to your telegram of September 5th the Government, after careful consideration of the whole matter, including objections of Victoria and British Architects to the approved resumption of competition, considers it advisable to proceed, owing to the fact that after the war the rebuilding of Europe will occupy the attention of British and Continental architects to such an extent that they will not be prepared to compete. Further postponement will only accentuate the difficulty, and meanwhile the large expenditure which has been incurred renders early occupation of the Capital very desirable. The work will also provide employment for hundreds of Australians after the war."

I am, Sir,

Your obedient Servant,

(Signed) R. MUIRHEAD COLLINS.



HERBERT PHILLIPS FLETCHER, D.S.O. [F.]
Major, Middlesex Hussars Yeomanry,
attd. Royal Flying Corps.
Accidentally killed while on duty (see pp. 305, 309).



ALFRED EDWARD CORBETT, *Fellow*,
Captain, Border Regiment.
Killed in action (see p. 250).



DOUGLAS MORLEY GRIFFIN, *Associate*,
2nd Lieut., King's Liverpool Regt.
Killed in action (see p. 293).



ANDREW DANSKIN AITKEN, *Associate*,
2nd Lieut., Lowland Field Company, Royal Engineers.
Killed in action (see pp. 309, 328).



PERCY CUNLIFFE PILLING, *Associate*.
Captain, Loyal North Lancashire Regt.
Died of wounds (see pp. 309, 328).



BALFOUR ABERCROMBIE, *Lieutenant*.
Private, Black Watch.
Died of wounds (see p. 326).



ARTHUR WINCH, *Associate*.
Lance-Corporal, 15th West Yorks Regt.
Killed in action (see p. 326).



CHARLES STONEHOUSE, *Associate*.
Lieut., 11th Bn. East Lancs. Regt.
Killed in action (see p. 326).



9 CONDUIT STREET, LONDON, W., 30th September 1916.

CHRONICLE.

The R.I.B.A. Record of Honour: Thirty-fourth List.

Architects fallen in the War.

ABERCROMBIE, BALFOUR [*Licentiate*], Private in the Black Watch, serving in France. Died of wounds on 31st July. Aged thirty-eight.

Balfour Abercrombie was educated at Paisley Grammar School and Rontenburn Boarding School. Intended for the profession of architecture he spent about a year at the joiner's bench and was then articled for five years to Mr. James Miller, A.R.S.A. [*F.*], of Glasgow, studying meanwhile at the Glasgow School of Art. On the completion of his articles he remained with Mr. Miller for two years as assistant, and started practice for himself in 1906. He was the architect of numerous villas in Paisley, Troon, Wemyss Bay, &c., of a church at Renfrew, a model farm at Kilmacolm, and considerable extensions at Brockwood Park, Hants. By arrangement with several clients he cancelled his engagements in October, 1915, and joined the Argyll and Sutherland Highlanders as a private. Two months ago when a draft to the Black Watch was proceeding to the front in France he volunteered for immediate active service and was accepted. After ten days in the trenches he took part in an attack, and on returning to billets some six miles from the front was wounded with three of his comrades by a shell which burst overhead, and he succumbed to his injuries the same evening.

STONEHOUSE, Lieut. CHARLES [*A.*], 11th Battalion East Lancs Regt. Killed in action in France on 1st July. Aged thirty-four.

Lieut. Stonehouse was the third surviving son of Mr. F. Stonehouse, of Blackburn. He was a pupil of Messrs. Briggs and Wolstenholme, of Blackburn and Liverpool, for five years, and was with them afterwards for a year as assistant. He was subsequently in the offices successively of Mr. N. Hartley Hacking, of Manchester, and Mr. John T. Proffitt, of Tamworth, Bolton. He was elected Associate of the Institute in 1910. On the outbreak of war he enlisted as a private in the Accrington "Pals" Battalion of the East Lancs Regt., and after promotion through the N.C.O. grades was granted a commission in the same regiment. He served both in Egypt and France.

His Commanding Officer, Lieut.-Colonel Rickman, writing to Mr. Stonehouse, senior, says: "I cannot express to you how deeply we feel his loss and how much I have appreciated his good services. He carried out his duties calmly and coolly, and in him the regiment has lost a fine soldier, a brave leader of men, conscientious in all his duties. No matter how hot the fire, he always appreciated the situation in his calm, cool way. On the day he was hit nothing could have been finer than the way he led his men to the assault. In spite of intense artillery, machine-gun and rifle fire, he had his men forward to endeavour to capture the objective allotted by the higher command."

STUBBS, Lance-Corporal EDWARD WOODHOUSE [*A.*], 72nd Section, 32nd Division, R.A.M.C. (T.). Killed in action on 7th August. Aged twenty-eight.

Lance-Corporal Stubbs was the only son of Mr. J. Woodhouse Stubbs, artist, of London, and served his articles with Mr. W. J. Dunham, of Norwich.

He was elected Associate of the Institute in 1910, having been placed 6th in the Intermediate Examination, 1907. He first took up domestic work, assisting Mr. W. G. Ross, Broad Street, and Mr. G. Walton, Emperor's Gate, but for the last few years was with Messrs. Searle & Searle, Paternoster Row, being chiefly occupied with factory designing, in which branch, owing to his very considerable knowledge of machinery, he was specialising. He held strong views on the improvement of workmen's cottages, and had been awarded prizes in two of the open competitions for improved cottages.

Lance-Corporal Stubbs was helping to remove wounded civilians out of houses being demolished by shell-fire during bombardment, when he was instantaneously killed. His Commanding Officer, Capt. Cattlin, writes: "He undoubtedly met his death with the greatest heroism and self-sacrifice. His action is greatly admired by us all."

The Staff-Sergeant, on behalf of the men of the 72nd Section, writes: "He was the most useful and popular member of the Section—always ready to help any one of us in any difficulty."

A permanent memorial is to be erected over his grave by the 72nd Section.

For over twenty years he suffered severely at times from asthma, which he bore with great bravery and cheerfulness—always thinking of others first. His kindly and chivalrous disposition endeared him to all his friends, and a very promising career has been cut short.

WINCH, Corporal ARTHUR [*A.*], 15th West Yorks Regiment. Killed in action in France on 1st July.

Corporal Winch served his articles with Mr. Walter A. Hobson, of Leeds, and studied at the Leeds School of Art, passing twice through its two years' architectural course. He was for five years assistant with Mr. Hobson after completing his articles, and started practice on his own account in 1909. He was elected an Associate of the Institute in 1911.

BOWLES, 2nd Lieut. BERNARD G., The Buffs. Killed in action on 3rd September. Aged twenty-two.

2nd Lieut. Bowles, a member of the Architectural Association, was the son of Mr. Charles W. Bowles [*F.*], of Sevenoaks, Kent, in whose office he was being trained. Granted a commission from the Inns of Court O.T.C. in January, 1915, he went to the Front last Easter, and in two days found himself in the front trenches. On 18th August he was slightly wounded. He was again twice in action and was killed while leading his men in an attack. His Colonel writes: "He was one of the bravest of soldiers. He had previously been wounded, but refused to go down."

DENISON, Captain R. D., Royal Warwickshire Regt. Killed in action.

Captain Denison before the war was architect to Lloyds' Bank.

FORBES, 2nd Lieut. WILLIAM ALEXANDER STANHOPE, Duke of Cornwall's Light Infantry. Killed in action on 4th September. Aged twenty-three.

2nd Lieut. Forbes was the only son of Mr. Stanhope Forbes, R.A., of Newlyn. He was educated at Bedales College, Petersfield, and in 1914 was awarded the A.A. Travelling Studentship.

LIVINGSTONE, Private GEORGE M., of Stirling, Argyll and Sutherland Highlanders. Killed in action. Aged thirty-five.

REID, 2nd Lieut. JOHN, King's Liverpool Regt.
Killed in action on 18th August.

2nd Lieut. Reid served his articles with Messrs. Morter and Dobie, architects, of Dale Street, Liverpool.

SPARROW, 2nd Lieut. FRANK E., R.E. Killed in action.

2nd Lieut. Sparrow, of Dublin, was a member of the Royal Institute of the Architects of Ireland, and had held the position of Inspector in the Architectural Department of the Irish Office of Works. He was for some time Hon. Secretary of the Architectural Association of Ireland. **I**

WATT, 2nd Lieut. COLIN R. J., R.E. Died of wounds.
Aged twenty-four.

Wounded.

BARROWCLIFF, 2nd Lieut. A. M. [*Student*], Leicester Regt., attached R.E.

CLOUTING, 2nd Lieut. CHARLES EMERSON [*A.*], East Kent Regt.

KNIGHT, Lance-Corp. SHIRLEY [*Student*], Royal Engineers.

NEWTON, Lieut. WILLIAM GODFREY [*A.*], 23rd London Regt. (son of Mr. Ernest Newton, A.R.A., President). Badly wounded in left forearm. In hospital in London.

WORTHINGTON, Capt. J. HUBERT [*A.*], Manchester Regt.

Capt. Worthington was very seriously wounded, being shot through the body and lung, and through the thigh and the left arm and hand, and sustaining broken ribs among other incidental damage. His condition was very grave for a time and caused his friends much anxiety. He is now, however, out of danger and making a very good recovery. Capt. Worthington is a brother of Mr. Percy S. Worthington [*F.*], who has two other brothers very badly wounded.

Serving with the Forces.

The following is the Thirty-fourth List of Members, Licentiates, and Students R.I.B.A. serving with the Forces, the total to date being 67 Fellows, 491 Associates, 296 Licentiates, and 286 Students:—

FELLOWS.

Cresswell, H. O.: Staff Capt., Lands Branch, War Office.
Hall, Laurence Kirkpatrick: 2nd Lieut., R.G.A.
Spalding, R. H.: Red Cross Unit, Hospital Ship, "Glenart Castle."

ASSOCIATES.

Brooker, A. E.: R.N.A.S.
Brooks, W. E.: Royal Naval Air Service.
Cable, J. Sydney: Cadet, Artillery School.
Cosway, R. W. A. J.: Lieut., Montgomeryshire Yeomanry.
Davison, William R.: 2nd Lieut., R.F.A.
Dewhurst, R. H.: 16th Reserve Battery, R.F.A.
Hill, Claude E.: [Corpl., R.A.M.C. [T.].]
Livock, S. G.: R.A.M.C. (serving in France).
Loveitt, R. A.: R.N.A.S.
Moore, E. J. E.: London Rifle Brigade.
Morran, H. S.: Lieut., New Zealand Field Artillery.
Ritchie-Fallon, W. A.: With General Smuts's Forces.
Robinson, A. D.: O.C. Left Half "A" Coy., 2nd Labour Bn., R.E., B.E.F., France.
Ross, J. Maclaren: 2nd Lieut., R.E., Tunnelling Corps.

Sullivan, L. Sylvester: 2nd Lieut., 13th Bn. Queen's R.W. Surrey Regt.

Thompson, Morris: Lieut., 4th (Res.) King's Own Yorkshire Light Infantry.

Venning, H. J.: Lieut. and Inspector of Works, Staff for R.E. Services, Div. Officer R.E.

Wade, Charles Paget: East Anglian Royal Engineers.

Willcocks, C. B.: 2nd Lieut., R.F.C.

LICENTIATES.

Barker, T. C.: 5th Yorkshire Regt.

Brameld, Thomas: Cadet, R.H.A.

Cox, A. S.: 2nd Lieut., Royal Flying Corps.

Davies, Earl B.: Officer Commanding 2/3rd E.A. Field Company, R.E.

Ellison, F. B.: 1st Hereford Regt.

Ferry, E. Frank: Royal Engineers.

Ford, T. W.: Royal Flying Corps.

Gannon, W.: Royal Engineers.

Gask, John Harold: Royal Garrison Artillery.

Heaton, R. A.: 14th Bn., Manchester Regiment.

Ingram, H. C.: Artists' Rifles.

Lennox, Gavin: Sapper, Royal Engineers.

Lloyd, B. M.: 31st Royal Fusiliers.

Lockhart, J. W.: Royal Flying Corps.

Mark, O. H.:

Nisbet, E. C.: Cadet, R.G.A.

O'Brien, Edward: 2nd London Sanitary Company, R.A.M.C.

Shaw, Malcolm G.: F Battery, Motor Machine-Gun Section.

Spurgin, K. B.: Major, 103rd Bn., C.E. Force.

Stabler, A. W.: Sapper, 3rd Company, Durham (Fortress) Royal Engineers.

Taylor, Harold: Royal Engineers.

Thomas, H. W.: 2nd Lieut., K.F.R.E., 2/4th Company.

Tinniswood, Alfred: Artists' Rifles.

Weston, Sidney Isidore: R.N.A.S.

Whyte, J. B.: Royal Navy.

Young, Alex.: Royal Engineers.

STUDENTS.

Haywood, A. N.: Sub-Lieut., R.N.V.R.

Mitchell, C. H.: 22nd Reinforcements, N.Z. Forces.

Read, K. H.: Royal Engineers.

Winebaum, G. G.: Royal Flying Corps.

R.I.B.A. STAFF.

MacAlister, Ian, *Secretary*: Lieut., Royal Defence Corps.

Baker, F. G., *Chief Clerk*: East Surrey Regt., attached to Army Pay Corps.

Professional Classes War Relief: The Maternity Home.

The Professional Classes War Relief Council desire to make known the assistance offered by them to the wives of professional men hard hit by the war. At 13 and 14 Prince's Gate, S.W., the Council maintain a Maternity Home where expert care and nursing are offered for a nominal fee. This has been made possible by the generosity of the medical and nursing staff, who give their services voluntarily. Since the Home was opened in 1915, 180 babies have been born there, and the Council have also given considerable outside assistance to a large number of applicants whose family ties have prevented them from leaving their own homes. No other organisation offers assistance to the professional classes in this particular form, and it is desirable that it be made as widely known as possible. Applications should be made to the Secretary at the above address.

OBITUARY.

Captain Percy Cunliffe Pilling [A.].

Captain P. C. Pilling, who died of wounds on the 6th August, joined the Territorials seven years ago, and was in command of "B" Company when the Battalion was mobilised on the outbreak of war. After they went to the front he was transferred to "A" Company, and about two months ago was appointed second in command of the Battalion. Throughout his military career he was enthusiastic and was esteemed both by his brothers and in the ranks as an efficient and able officer.

Educated at Bolton Grammar School, Capt. Pilling began his training as an architect by a course of engineering in Messrs. Dobson & Barlow's works. He later studied in London, and was for some time assistant in Sir Wm. Emerson's office. Returning to Bolton about twelve years ago, he joined his father, Mr. Joseph Pilling [F.], in partnership. He passed the Qualifying Examination and was elected Associate of the Institute in 1904. Captain Pilling was held in the highest esteem by a wide circle of friends in the town, and gained some public fame as a playing member of the Bolton Garrick Club. He was thirty-seven years of age and leaves a widow, formerly Miss Walker of Kensington House, and a daughter.

Lieut.-Col. Hesketh, O.C. Loyal North Lancs Regt., writes:—"As Captain Pilling's Commanding Officer, I can truthfully say he was one of my best officers, always thinking of the best methods of improving the efficiency of the Battalion. I have been able to notice this more so during the last five weeks, when he has been acting as my second in command, his suggestions and advice being most helpful to me. It was only on the 4th of August that I had forwarded his name for a Majority. It has been a great blow to me in two senses, as I have lost a great friend and staunch supporter, thoughtful and always studying the care of his men and the general efficiency of the Battalion. I may add that the loss is mourned by us all, especially those who had served with him throughout."

Second Lieut. Andrew D. Aitken [A.].

Second Lieut. Andrew D. Aitken, whose death in action was announced in the last issue of the JOURNAL, was the son of the late Bailie John Aitken, and served his articles with Mr. John Scotland, architect, of Airdrie. He was afterwards in the offices successively of Messrs. Dykes & Robertson and Mr. James Miller, A.R.S.A. [F.], of Glasgow, during this time studying under Professor Charles Gourlay [A.], at the Royal Technical College, Glasgow. He was elected Associate of the Institute in 1906 and started practice the same year. He held for a time the appointment of teacher of architecture at Coatbridge Technical College, and later a similar position at Airdrie High School, resigning it to join the Army in January, 1915. He went out with his company to the Dardanelles and received his commission there. After the abandonment of the Dardanelles campaign he was sent to Egypt, where he met his death on the 4th August, in the fighting near the Suez Canal.

David Bird [A.].

Mr. David Bird, who died on the 29th July, had been an Associate of the Institute since 1889. He was articled in 1880 to Mr. William Dawes, of Manchester, and studied at the Manchester School of Art. He continued for some time with Mr. Dawes as assistant, and then started practice

on his own account. Among his principal works were the erection of the tower to St. Paul's Church, Sale, and making new entrance and other alterations to the church; the building of a large mission hall for the same parish, and enlargement of the schools; also enlargement of the Brooklands High School for Boys. Failing health of late years had obliged him to give up practice.

CORRESPONDENCE.

Cards for Architects serving with the Forces.

9 Conduit Street, W., 26th September 1916.

To the Editor, JOURNAL R.I.B.A.,—

DEAR SIR,—I should like all architects who read the JOURNAL to know that the efforts of my Committee have resulted in the recognition by the War Office of a card bearing the Chairman's signature, setting out the professional credentials of men on our files who are now serving, which can be kept in Army Book No. 64, and thus carried about to be produced if any special services are required. The War Office has supplied all Commanders-in-Chief at home and abroad with one of these blank cards, accompanied by a covering letter, and I have so many expressions of appreciation of this scheme from men serving, that I feel it should be as widely known as possible.

The cards are only sent to men who have filled in a War Service Form issued by my Committee through the JOURNAL and the professional Press last November, but these forms can still be obtained from the R.I.B.A., and I shall be most pleased to bring before the Committee any filled in by colleagues who are serving, with a view to the issue of the card in question to the applicants.

ALAN E. MUNBY,
Hon. Sec. Selection War Committee.

NOTICES.

Australian Parliament House Competition.

The attention of members is directed to the Australian Government's cablegram on page 323.

Licentiates and the Fellowship.

The next Examination of Licentiates desiring to qualify for Candidature as Fellows will take place in January, 1917. Applications for admission to the Examination must be sent in by the end of the current year. Full particulars may be had on application to the Secretary, R.I.B.A.

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